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ATRAZINE: Reducing Risks to Groundwater from Use in Sweet Corn

Practical Approaches for Users

Introduction. The herbicide atrazine has been detected in Long Island's groundwater. Atrazine is found in several products commonly used on sweet corn fields for annual weed control. This fact sheet was prepared to help corn growers continue to produce high quality products while using less of this pesticide in an effort to protect Long Island's groundwater.

This and other factsheets have been developed as part of the Long Island Pesticide Pollution Prevention Strategy, which became effective July 2014. The strategy was developed by the NYS Department of Environmental Conservation (DEC) in collaboration with numerous stakeholders. The goal of the strategy is to protect groundwater and surface water from pesticide related contamination while continuing to meet the region's pest management needs.

Protect Our Drinking Water

The Long Island aquifer is used by nearly three million people as a source of high-quality drinking water. The aquifer is an underground water source that yields over 300 million gallons of drinking water every day. The characteristics that allow the aquifer to reliably supply this much water also make it vulnerable to contaminants from the surface. This is especially important for materials like atrazine that have widespread use and can move easily through soil to the underlying groundwater. For these reasons, the agriculture industry needs to exercise careful environmental stewardship when using atrazine.

A profile of a Long Island's sandy/gravelly subsoil.

Modify Practices (Best Management Practices)

To reduce or eliminate the risk of movement of atrazine to Long Island's groundwater, operators should begin modifying day-to-day practices as follows:

Application Rates - While the maximum labeled rate for all corn types is 2 lb. active ingredient per acre (4 pts Aatrex 4L), most vegetable growers use lower rates to avoid problems with subsequent crops. By reducing the rate to 1.0 to 1.25 lb./A, many annual grass weeds will escape control. For this reason, it is sometimes necessary to apply other pre- and/or post-emergence herbicides to broaden the control spectrum. Atrazine is often used with Prowl for control of grasses.

Application Timing - Currently, atrazine is generally applied only once on a corn crop during the early part of the growing season. Restricting the number of applications to one per year helps ensure that over-application does not occur on any given location. In addition, application timing should be adjusted to avoid applications prior to or immediately after heavy rain events.

Application Method - Atrazine can be applied by banding over the row and either cultivating or using post-emergence herbicides between the rows. And improved calibration of application equipment can ensure correct application rates.

KEY POINTS

Three key practice modifications can be applied to improve atrazine usage:

- Use reduced rates in combination with other herbicides
- Restrict use to one spring application per growing season
- Apply over the row and cultivate or make post-emergence applications between rows.

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Some Alternative Herbicides

Several pre- and post- emergence herbicides can be used in place of, alternating with, or in combination with atrazine on Long Island. Some of these alternatives are summarized below.

Trade Name	Active Ingredient	Pre/Post	Weeds Controlled*	CORN Rate Range (per A)
Accent	nicosulfuron	Post	GR	1/3-1 1/3 oz
Aim EC	carfentrazone	Post	BL	0.5-25.6 fl oz
Basagran	bentazon	Post	S	1-2 pt
Callisto	mesotrione	Pre/Post	BL	Pre: 6-7.7 fl oz, Post: 2.5-3 fl oz
Impact	topramezone	Post	BL,GR	0.5-0.75 fl oz
Laudis	tembotrione	Post	BL,GR	3 fl oz
Permit	halosulfuron	Post	BL,S	2/3-1 1/3 oz
Prowl® 3.3EC	pendimethalin	Pre/Post	BL	1.8-4.8 pt (northern states)
Prowl® H2O	pendimethalin	Pre/Post	BL	2-4 pt (northern states)
Roundup Weathermax	glyphosate	Pre/Post Harvest	BL,GR	16-32 fl oz (non-RUP Ready)
Sandea	halosulfuron	Pre/Post	BL,S	2/3-1 1/3 oz
Weedar 64 (and others)	2,4-D	Post	BL	1/2-2 pt

*BL=broadleaves, GR=grasses, S=sedges

Integrated Pest Management Practices

Biological and Cultural

- Plant a cover crop after harvest for weed competition. Late summer and fall planted cover crops like annual rye will germinate quickly and compete with both fall and spring germinating weeds. Corn seed can be planted into a cover crop that has been killed either mechanically or chemically.
- Use of cultivation practices for weed control. Between-row cultivation is often practiced in combination with the fertilizer side-dressing operation. This cultivation will usually remove escaped annual weeds that are still small and vulnerable. However, cultivating fields that are infested with perennials like yellow nutsedge can make the problem worse by moving plant parts further down the row. To reduce this problem early, post crop-planting tine cultivation can kill young weeds without digging up and dragging perennials.
- Change crop rotations to disrupt life cycles and control weeds not well managed in sweet corn.
- Following harvest, use mowing practices to reduce weed seed production.

Scouting

Scout and map weeds for selection of optimum weed control practices. Weed populations can be scouted at two periods in the crop life cycle, when the crop is just beginning to emerge, about 10 days after planting, to determine whether annual grasses or certain broadleaf weeds have escaped pre-emergence control (when it is still early enough to allow for post-emergence control measures to be taken), and at the end of the crop cycle, when perennial weeds like quackgrass and yellow nutsedge can be managed by post-harvest applications of glyphosate followed by vigorous disking to break up underground plant parts.

Irrigation Management Plans

Improved irrigation and development of irrigation management plans may reduce leaching by cutting down on the local areas of over-watering and washouts, which will also reduce water expenses. This may require equipment upgrades and monitoring of soil moisture, crop condition, and weather.

Trade names used in this publication are for convenience only. No endorsement of products is intended, nor is criticism of unnamed products implied.

CONTACT INFORMATION

Andrew F. Senesac, Ph.D., Weed Science Program, Cornell University Cooperative Extension of Suffolk County
Long Island Horticultural Research and Extension Center • 3059 Sound Avenue, Riverhead, NY 11901
P: (631) 727-3595 • F: (631) 727-3611 • afs2@cornell.edu • ccesuffolk.org

For more information or electronic copies of this factsheet, go to ccesuffolk.org. For more information about the Long Island Pesticide Pollution Prevention Strategy, go to http://www.dec.ny.gov/chemical/87125.html. (February 2016)